

REMARKS

Review and reconsideration on the merits are respectfully requested.

Applicants have combined claim 1 with present dependent claim 3, by placing claim 3 in independent form. Since claim 3, in this regard, now recites that which was implicitly stated previously, no narrowing of scope occurs by virtue of this amendment. Also, claim 3 recites that the resin substrate is "obtained by flow casting", as indicated at page 8, line 6 from the bottom, of the specification. No new matter is added by this amendment, and its entry is respectfully requested.

Claims 1 and 4 are cancelled in view of the combination of claims 1 and 3. The dependency of claims 2, 5 and 7 has been amended accordingly.

In paragraphs 5 and 6 at pages 3-4 of the Office Action, claims 1, 3, 5 and 7 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hinata (U.S. Patent 5,687,465) in view of Khan (WO 97/39380).

The Examiner argues that Hinata discloses and shows a liquid crystal cell substrate comprising a polycarbonate film supporting substrate (9) (corresponding to Applicant's resin substrate) and, closely adhered thereon, a gas barrier layer (10), a resin hard coat layer (11) and a polarizing layer (12), referring to Figure 11 and column 5, lines 33-38.

The Examiner admits that Hinata does not explicitly disclose that the resin hard coat layer is crosslinked, as is recited in Applicant's claim 1.

However, the Examiner argues that it is known in the art that a crosslinked resin layer provides better mechanical strength and has excellent heat resistance. The Examiner thus

concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made, to substitute the resin layer of Hinata with a crosslinked resin layer since it will have the advantage of better mechanical strength and excellent heat resistance.

The Examiner further admits that Hinata differs from the claimed invention of claim 1, because there is no disclosure that the polarization layer comprises a coating layer (or that the coating layer comprises the dichroic dye or dichroic dye having lyotropic liquid crystallinity, etc. of the dependent claims).

Khan is cited as allegedly disclosing a liquid crystal display with a polarization layer wherein the polarizing layer comprises a coating.

The Examiner therefore concludes that the subject matter of claim 1 would have been obvious to one of ordinary skill in the art, because Khan would have provided motivation to modify the polarization layer of Hinata to include a coating layer.

This rejection is respectfully traversed.

Hinata in view of Khan fail to defeat the patentability of the present claims, as amended, for at least the following reasons.

As can be seen from Fig. 11 and the disclosure thereof, Hinata discloses a cell substrate comprising a substrate (9), a gas barrier layer (10), a resin hard coat layer (11) and a polarizing layer (12). As discussed at column 5, lines 34-36 of Hinata, the polarizing layer is a polarizer sandwiched between other films.

A polarizer generally used in this art is a polyvinyl alcohol film having iodine adsorbed and oriented therein, and practical thickness of the polarizer is 20 to 30 μm . Cellulose acetate film used to protect both surfaces of the polarizer has a practical thickness of 70 to 100 μm .

Simply totaling these thicknesses, the polarizing layer of Hinata is 160 μm (minimum thickness) to 230 μm (maximum thickness).

On the other hand, the polarizing layer of the present invention has a thickness of 5 μm or smaller. Assuming, for sake of argument, that the thicknesses of the other elements (besides the polarizing layer) are the same between the present invention and Hinata, Hinata provides a liquid crystal cell having a thickness of 155 to 225 μm larger than that in the present invention. The present invention matches the recent demands of small thickness and light weight. Thus, it is believed that the present invention is technically distinguished from Hinata.

When a resin substrate obtained by flow casting is selected, smoothness of substrate surface is good, in addition to excellent mass-production property. Therefore, there is great practical merit that even when a thin polarizing layer is formed, defective portion such as pin-hole does not generate.

Khan discloses a polarizing layer by coating. However, Khan does not contain any disclosure or suggestion that a substrate obtained by flow casting is used as a substrate, a gas barrier layer, a crosslinked resin layer and a polarizing layer are formed on the substrate, and as a result, a polarizing layer having small thickness and light weight, being excellent in mass-production property and being difficult to cause defective portion, can be formed.

In view of the above, it is therefore submitted that the combined teaching of Hinata and Khan does not render the present invention obvious.

For the foregoing reasons, reconsideration and withdrawal of this rejection is respectfully requested.

In paragraphs 7 and 8 at page 5 of the Office Action, claims 2, 4, 6 and 8 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hinata in view of Khan as applied to claims 1, 3, 5 and 7 above, and further in view of "HDBU", as cited.

This rejection is respectfully traversed. Each of the rejected claims depends directly or indirectly from independent claim 3. Therefore, upon allowance of independent claim 3 for the reasons discussed above, claims 2, 6 and 8 should be allowed as well. The rejection is moot with respect to cancelled claim 4.

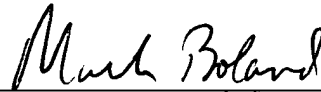
In view of the foregoing, reconsideration and withdrawal of this rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO.: 09/661,057

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

Please amend the title shown on page 1, line 1 as follows:

LIQUID CRYSTAL CELL SUBSTRATE INCLUDING RESIN SUBSTRATE, GAS
BARRIER LAYER, CROSSLINKED RESIN LAYER AND POLARIZING LAYER

IN THE CLAIMS:

Claims 1 and 4 are cancelled without prejudice or disclaimer.

Claims 2, 3, 5, and 7 are amended as follows:

2. (Amended) The liquid crystal cell substrate as claimed in claim [1] 3, wherein the resin substrate comprises a thermosetting epoxy resin.

3. (Amended) [The liquid crystal cell substrate as claimed in claim 1] A liquid crystal cell substrate comprising a resin substrate obtained by flow casting and, closely adhered thereon, a gas barrier layer, a crosslinked resin layer and a polarizing layer, said polarizing layer comprising a coating layer, wherein the polarizing layer has a thickness of 5 μm or smaller.

5. (Amended) The liquid crystal cell substrate as claimed in claim [1] 3, wherein the polarizing layer comprises a dichroic dye having lyotropic liquid crystallinity, a liquid crystal polymer layer containing a dichroic dye, or a lyotropic substance containing a dichroic dye.

7. (Amended) The liquid crystal cell substrate as claimed in claim [1] 3, wherein the polarizing layer is in contact with one side of the resin substrate or is located between the gas barrier layer and the crosslinked resin layer.